

of each month from October to May, inclusive, at such time and place as the Club may direct. Nine members shall constitute a quorum for the transaction of business. The President may call special meetings upon his own motion.

3—*Order of Business*

The following shall be the order of regular business at all meetings of the Club except at the Annual Meeting:

1. Reading of the minutes of the last meeting.
2. Election of new members and announcement of resignations.
3. Reports of committees.
4. Deferred business.
5. New business.
6. Scientific program.

At the Annual Meeting the order of business shall be as follows:

1. Reading of the minutes of the last meeting.
2. Election of new members and announcement of resignations.
3. Reports of officers, delegates, and representatives.
4. Reports of standing committees.
5. Reports of other committees.
6. Deferred business.
7. New business.
8. Report on results of election of officers.

4—*Standing Committees*

The Standing Committees shall be as follows:

1. Program Committee.
2. Field Committee.
3. Local Flora Committee.
4. Publications Exchange Committee.

5—*Program Committee*

The Program Committee shall arrange for the scientific program of the meetings of the Club during the year.

6—*Field Committee*

The Field Committee shall select the dates, places, and leaders of the field trips and publish notices of the same, and may arrange for special indoor meetings for the study of plant material collected.

7—*Local Flora Committee*

The Local Flora Committee shall consist of two distinct subcommittees, one for the phanerogams and one for the cryptogams, whose duty it shall be to prepare complete and accurate lists of all the plants, native, naturalized, and adventive, occurring within one hundred miles of New York City, and to have such lists published with as much description and illustration as they shall deem best, and as the funds obtainable for that purpose shall warrant. It may arrange for special indoor meetings for the purpose of critically studying plant material assembled for this purpose.

8—*Publications Exchange Committee*

The Publications Exchange Committee shall consider and, subject to approval by the Council, pass upon all requests for exchanges of publications with the Club, keep an accurate record of the exchanges, and render a report of the same to the Club at the Annual Meeting.

9—*Donations and Bequests*

A record shall be kept by the Treasurer of the source, nature, and description of each donation and bequest.

10—*Amendments to the By-laws*

Amendments to the By-laws shall be prepared in writing and referred to the Council, which shall report on them at a subsequent regular meeting of the Club, and may be adopted by a majority vote of those present.

BOOK REVIEWS

An Introduction to Botany*

R. C. BENEDICT

A new textbook in botany starts out with a difficult task to accomplish—it must make a place for itself in competition with a considerable number of existing volumes, practically all of which are of good quality. In a list of twenty or so botanies which bear an imprint within the past ten years, differentiation is not so much the quality of scholarship and presentation as in the general design of the books, the phases of subject matter emphasized, and the extensiveness and intensiveness of the treatment.

The new Haupt stands almost certainly at or near the extreme of simplicity of treatment and limitation of scope, in keeping with its announced design for use in a one-semester course in botany, or in one term of a year course in biology. It may be granted that the author has achieved his aim in some respects; the text is generally clear, almost purely descriptive; intensive treatment of any topic is rigorously avoided. At the same time the general facts of plant structure and nutrition, reproduction, classification, and genetics are adequately and accurately covered in their bare essentials. The illustrations are of high quality, with many photographs and drawings by the author.

While undoubtedly there are not a few classes and institutions where such a restricted text will be welcome, the reviewer believes that a college botany text should make more demands upon its readers, and offer guidance to the ambitious student to go beyond the volume in hand. There are no bibliographies in this volume. Also, some use of the heuristic method, so carefully worked out in the Sinnott, might well have been made. The McGraw-Hill Co., has certainly issued the two extremes of thoroughness of treatment, in the Haupt at one end, and the Hill, Overholts, and Popp at the other.

* Haupt, Arthur W. An introduction to botany. McGraw-Hill, 1938. \$3.00.

Cryptogamic Botany*

R. C. BENEDICT

Under a title reminiscent of the 19th century, "Cryptogamic botany," Gilbert M. Smith has published a comprehensive and detailed study of the morphology and life histories of representative Thallophytes, (excepting the Bacteria) Bryophytes, and Pteridophytes. In its wide range and scholarly quality, the text is an important contribution to the field of botany. While no attempt has been made to be exhaustive for the various sub-groups, important types are very adequately dealt with. Each chapter has an excellent and detailed bibliography.

In the discussion of the algae, as might be expected from Dr. Smith's long research in this group, the most original and radical treatment is found. It is proposed that the old catch-all division of Thallophytes be broken into seven phyletic groups or divisions of algae, and two others, to include the fungi, and slime moulds. These nine divisions are as follows: Chlorophyta, grass-green algae; Euglenophyta, euglenoids; Pyrrhophyta, cryptomonads and dinoflagellates; Chrysophyta, the yellow-green algae (diatoms, etc.); Phaeophyta, or brown algae; Cyanophyta, blue-green algae: Rhodophyta, red algae; Myxophallophyta, slime moulds; and Eumycetes, or fungi.

For such a breaking up of the heterogenous "Thallophyta" there is much to be said. It seems probable, however, that the mycologist would find equal basis for dividing the fungi into at least three coordinate divisions, and that questions will be raised as to the possible union of certain algae with some of the fungi, and the bacteria with the Cyanophyta. When it comes to the vascular plants, Smith is more conservative; he adheres to the older division into Pteridophytes and Spermatophytes, in spite of the evidence as to the unreliability of the seed habit as a basis of phyletic division. (Vide Eames, Vascular plants. 1936.)

* Smith, Gilbert M. Cryptogamic botany. Vol. I. \$4.00; Vol. II. \$3.00. McGraw-Hill, 1938.

PROCEEDINGS OF THE CLUB

MEETING OF NOVEMBER 16, 1938

The meeting of the Torrey Club held at Columbia University was called to order by the first vice-president, Dr. Ralph Cheney, at 3:35 P.M. with 26 persons present.

The minutes of the meetings of October 19 and November 1 were adopted as read.

The following were elected annual members of the Club: Miss Lucille M. Joyce, 386 Bergen St., Brooklyn, N. Y.; Miss Mary Elizabeth Pierce, Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, N. Y.

Miss Edith V. Folger, 21 E. Magnolia Ave., Maywood, N. J., and Miss Bertha Perlmutter, 4829 61st St., Woodside, Long Island, N. Y., were elected associate members.

The resignation of Mrs. Wanda K. Farr, Boyce Thompson Institute, 1086 N. Broadway, Yonkers, N. Y. and Dr. Samuel Kaiser, Biology Department, Brooklyn College, 80 Willoughby St., Brooklyn, N. Y., were accepted with regret.

The transfer of Miss Alexandra Kalmykov, 473 West 158th Street, New York, N. Y., from associate to annual membership was approved.

Dr. B. O. Dodge, Chairman of the Nominating Committee presented his report to the Club, the nominations being as follows:

(Vote for One)

<i>President</i>	<i>1st Vice- President</i>	<i>2nd Vice- President</i>
A. H. Graves	R. H. Cheney	W. S. Thomas
P. W. Zimmerman	R. C. Benedict	J. J. Copeland
Sam F. Trelease	G. T. Hastings	Cornelia L. Carey
<i>Treasurer</i>	<i>Corr. Secretary</i>	<i>Rec. Secretary</i>
H. N. Moldenke	J. S. Karling	Miss C. Chandler
<i>Editor</i>	<i>Bibliographer</i>	<i>Business Manager</i>
R. P. Wodehouse	Mrs. E. H. Ful- ling	M. Levine

*Delegate to Council of
N. Y. Academy of
Sciences*

W. J. Robbins

*Representative on Board
of Managers, N. Y.
Botanical Garden*

T. E. Hazen

(Vote for Four)

Members of the Council

Mrs. G. P. Anderson

F. E. Denny

H. H. Clum

W. J. Robbins

John M. Arthur

Alfred A. Gunderson

E. B. Matzke

(Vote for Two)

Representatives on the Council of the A. A. A. S.

John H. Barnhart

William Crocker

The scientific part of the program consisted of reports by Mr. D. A. McLarty and Mr. Arthur B. Hillegas of the Botany Department of Columbia University.

Mr. McLarty reported on "The Identity and Relationship of Certain Species of *Pseudolpidium*."

"In 1892 Fischer reinstated Cornu's genus *Olpidiopsis* to its original status and established the genus *Pseudolpidium* to include small, *Olpidiopsis*-like, chytridiaceous parasites of various water molds which exhibit no adjacent cell in relation to their resting spores. Fischer described the zoosporangia of *P. saprolegniae* as being thin-walled and spherical or oval in shape in contrast to long-ellipsoidal or cylindrical zoosporangia as in the case of *P. fusiforme*. In each case he described a heavy-walled, spiny resting spore similar to the zoosporangium with which it was associated.

"In swollen filaments of *Achlya* obtained in November, 1937, zoosporangia of *P. fusiforme* were observed and a study of the life cycle and cytology of the species was begun. However, it was soon noted that dependent upon the conditions of growth it was possible to obtain in one culture all the types of sporangia mentioned above. The spiny sporangia proved to be thin-walled and germinated directly. Thick-walled, spherical, spiny sporangia similar to those described by Butler for certain species of *Pseudolpidium* were observed from time to time. To determine

the relationships which exist between these structures culture experiments were begun.

"Using a micropipette a few zoospores were collected from a germinating fusiform sporangium and sown in sterile charcoal water in a petri dish containing a young culture of pure *Achlya*. Within twenty-four hours several fusiform sporangia appeared in the *Achlya* filaments. Each zoospore gave rise to a sporangium without fusions to produce a plasmodium.

"From this culture single sporangia were isolated and monosporangium cultures of the fungus were established. The primary infection of the pure *Achlya* culture resulted again in the production of a few solitary fusiform sporangia. However in the course of four or five days secondary infection took place and large swellings were formed in the filaments which contained many spherical to cylindrical zoosporangia varying in size over a large range. Finally many of the sporangia became spiny but germinated directly. Spherical, thick-walled, spiny resting spores were observed in cultures five days old.

"The various types of sporangia which Fischer described for his species are simply modifications of one form which seem to be dependent upon the amount of nourishment which the developing thallus can derive from the host. The "resting spores" which he described are zoosporangia which become spiny in accordance with the age and condition of the host. The true resting spore is spherical, thick-walled and spiny differing from that of *Olpidiopsis* only in the absence of the adjacent cell."

Mr. Hillegas spoke on the "Cytology of *Endochytrium*."

"The chytridiaceous form *Endochytrium* is a member of the Rhizidiaceae. The mature thallus consists of a typically flask-shaped, operculate zoosporangium and a well developed branched rhizoidal system. In addition to the evanescent sporangia thick-walled resting spores are formed.

"The sporangium develops as an enlargement of the germ tube. The protoplasm is at first hyaline, vacuolated and with large refractive globules. The refractive globules and vacuoles disappear giving rise to a uniformly granular protoplasm. These granules fuse to form the refractive globules of the zoospores. A wall is formed between the rhizoid and the sporangium at the granular stage. Nuclei are not found in the rhizoid and evidence indicates that the cytoplasm is withdrawn from the

rhizoid into the sporangium preceding the formation of the wall.

"The cytology of *Endochytrium* has been traced from the zoospore through the formation of the zoosporangium and the resting spore. The nucleus from the zoospore migrates into the germ tube and at that point where migration stops the center of organization of the thallus is established. The resting nuclei possess a large ring-shaped nucleolus. The spindle is intranuclear with central bodies appearing at the poles. A large nuclear cap is associated with the zoospore nucleus. Cleavage of the sporangium is by progressive furrowing to form the uninucleate zoospores.

"Germination of the resting spore is reported here for the first time. On germinating it gives rise to a sporangium. The resting spore is a prosperangium with one or more nuclei.

"Microchemical tests applied to the refractive substance of the zoospores, sporangia and resting cells indicate that this is a fat."

The meeting adjourned at 5:00 P.M. After the meeting tea was served in the mycology Laboratory.

CLYDE CHANDLER
Recording Secretary

MEETING OF DECEMBER 6, 1938

The meeting of the Torrey Botanical Club held at the American Museum of Natural History on December 6 was called to order by the President, Dr. Alfred Gunderson at 8:15 P.M. Forty-two persons were present.

Dr. William S. Thomas briefly described the memorial service held on Long Mountain for the late Raymond H. Torrey.

All business of the Club was omitted so that more time might be devoted to the program of the evening which consisted of an illustrated talk by Dr. Thomas on the "Edibility of Mushrooms." After discussing the historical aspect of mushrooms and organic constituents the speaker pointed out that there is really very little nutrient value in mushrooms since 88% of them is water. Some vitamins are present. There are about 210 calories in a pound of mushrooms. As various colored slides were shown Dr. Thomas told how edible species can be distinguished from poisonous types. If mushrooms turn blue when cut, bite the

tongue, or have a repulsive odor, they are to be avoided for table use.

The meeting adjourned at 9:45 P.M.

CLYDE CHANDLER
Recording Secretary

MEETING OF DECEMBER 21, 1938

The meeting of December 21 held at the New York Botanical Garden was called to order by the Corresponding Secretary, Dr. J. S. Karling. Twenty-three persons were present.

The minutes of the meetings of November 16 and December 6 were approved as read.

The following were elected annual members of the Club: Dr. Robert B. Gordon, State Teachers College, West Chester, Penn., and Mr. Leon Hervey, 2121 Grand Concourse, Bronx, N. Y. The transfer of Miss Louelle B. Conkling from associate to annual membership was approved.

The following were elected associate members of the Club: Mrs. Edith Bennett, 45 Pondfield Road West, Bronxville, N. Y., and Miss Blanche C. Mayhew, 144 S. 2nd Avenue, Mt. Vernon, N. Y.

The resignations of Mr. Louis S. Jaffe, 97 Chester Avenue, Brooklyn, N. Y.; Mr. Ludwig H. Grunebaum, 11 Brayton Road, Scarsdale, N. Y.; Mr. Oran B. Stanley, Colgate University, Hamilton, N. Y.; and Dr. Flora A. Haas, Arkansas State Teachers College, Conway, Ark. were accepted with regrets.

The resignation of the following associate member was also accepted with regret: Mrs. Robert C. Hill, Palisades, Rockland Co., N. Y.

The death of Dr. Charles P. Dring was reported.

Dr. H. K. Svenson was elected as an alternate for Dr. William Crocker who is a delegate to the American Association for the Advancement of Science but who is unable to attend the Richmond meetings.

The scientific program consisted of a lecture illustrated by lantern slides and motion pictures on "Recent Results of Growth Substance Research" by Dr. P. W. Zimmerman of the Boyce Thompson Institute for Plant Research, Inc.

“By means of lantern slides the work on growth substances was briefly reviewed and then recent findings were presented, under three headings as follows: 1. Extraction and identification of applied growth substances. 2. Effect of growth substances on storage organs. 3. Activation of chemicals with ultra-violet light.

“Three of the most important growth substances (*α*-naphthaleneacetic acid, indoleacetic acid, and indolebutyric acid) were applied to plants in various ways and extracted, tested, and identified at later dates. After gladiolus corms had been treated they grew shoots and roots. The new organs were extracted 24 days after treatment and found to contain the substance. In general the extracts were tested for physiological activity and identified by the colorimetric test and X-ray diffraction patterns.

“Bulbs, corms, tubers and storage roots were induced to grow an abnormally large number of roots from treatment with several growth substances. Phenylacetic acid was shown to break the dormancy of *Helianthus tuberosus* tubers, while naphthaleneacetic acid induced an abnormally large number of roots.

The *trans* form of cinnamic acid is not physiologically active but became active after treatment with ultra-violet light. Light changes *trans* to *cis* cinnamic acid which is the active form.

Plants treated with the *trans* cinnamic acid and then placed in the dark did not respond, but when placed in light made a pronounced physiological response. This indicates that the chemical is activated after it is applied to the plant.

“The lecture closed with time-lapse motion pictures showing plants responding to growth substances. The most striking was, perhaps, the Kalanchoe plant showing treatment of a part of the stem with growth substance which induced roots to grow from the treated region.”

The meeting adjourned at 5 P.M.

CLYDE CHANDLER
Recording Secretary

THE ANNUAL MEETING—JANUARY 3, 1939

The annual dinner of The Torrey Botanical Club was held at the Men's Faculty Club of Columbia University on January 3 at 6 P.M. The business meeting was called to order at 7:10 P.M. by President Gunderson with 58 persons present.